

THE *PARALYCHNOPHORA* GROUP OF *EREMANTHUS*
(VERNONIEAE: ASTERACEAE)

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ABSTRACT. The species placed in *Paralychnophora* by MacLeish are returned to the genus *Eremanthus*, and two related species, *E. harleyi* and *E. santosii*, are described as new.

Key Words: Asteraceae, Compositae, Vernoniae, *Eremanthus*, *Paralychnophora*

Extensive work has been done on *Eremanthus* Less. and its relatives during the last 20 years. Some genera such as *Chresta* Vell. ex DC. (Robinson 1980) and *Paralychnophora* MacLeish (MacLeish 1984) have been removed from *Eremanthus*. One traditional genus, *Vanillosmopsis* Sch. Bip., has been placed in the synonymy of *Eremanthus* (MacLeish 1987). Recent authors still do not agree completely on all the generic limits. In two genera, *Eremanthus* and *Chresta*, the concepts of the present author remain more inclusive than those of MacLeish (1984, 1985a, b, 1987). The group treated in the present paper, *Paralychnophora*, is regarded by the present author as part of *Eremanthus*. MacLeish (1987) states that *Paralychnophora* is like *Lychnophora* in having a biseriate pappus and glomerules that are derived from the internode reduction of corymbose subglomerules. She distinguishes *Paralychnophora* on the basis of axillary, solitary glomerules and angled achenes. Of these features, only the rather solitary nature of the glomerules of heads, a feature noted by Baker (1873), can be used to distinguish the group from the broad concept of *Eremanthus*.

The present study of the *Paralychnophora* group has considered the generic problem, but it concerns problems mostly at the species level. As a result of the study, an unvalidated Glaziou name, *Eremanthus schwackei*, is placed in synonymy and two new species, *E. harleyi* and *E. santosii*, are described. The records of the names and synonyms are needed for a listing being prepared of all known Vernoniae of the Western Hemisphere.

Paralychnophora was a nom. nov. by MacLeish (1984) for *Sphaerophora* Sch. Bip., Jahresber. Pollichia 20–21: 402. 1863, non *Sphaerophora* Blume, 1850 (Rubiaceae). The type of *Para-*

lychnophora, *P. bicolor* (DC.) MacLeish, and two other species were included in *Paralychnophora* by MacLeish. All had been treated previously as *Eremanthus*. An initial problem was noticed in this study in *Eremanthus (Paralychnophora) schwackei*, a Glaziou species, that was recognized as distinct by MacLeish (1987), but which never has been validated. The proposed combination by MacLeish did not validate the species. In spite of the initial concern, the present study has shown that there now is no need to validate the Glaziou name. Instead, *E. bicolor* needs to be redefined, and two new species need to be distinguished and described. A listing also can be provided of specimens of *Eremanthus reflexo-auriculatus* Barroso that previously have been identified as *E. bicolor*.

The four species of the *Paralychnophora* group of *Eremanthus* can be distinguished by the following key.

1. Leaf blades with depressed areoles on upper surface; fertile branches with subopposite or opposite median bracts; corolla lobes with few hairs not extending beyond tips of lobes ... 1. *E. bicolor*
1. Leaf blades with weakly bullate or rugulose upper surfaces; fertile branches with strictly alternate bracts; corolla lobes with dense hairs distally, some extending beyond tips of lobes (2)
 2. Individual heads with 2 or 3 florets; leaf blades oblanceolate with narrowly cuneate bases 2. *E. santosii*
 2. Individual heads with 5–9 florets; leaf blades oblong to obovate with shortly acute to auriculate bases (3)
 3. Bases of leaf blades auriculate, often clasping the stem
..... 4. *E. reflexo-auriculatus*
 3. Bases of leaf blades obtuse to shortly acute, distinctly petio-
late 3. *E. harleyi*

1. ***Eremanthus bicolor*** (DC.) Baker in Mart., Fl. brasil. 6(2): 165. 1873. (Figure 1)

Albertinia bicolor DC., Prodr. 5: 81. 1836.

Sphaerophora bicolor (DC.) Sch. Bip., Jahresber. Pollichia 20–21: 402. 1863.

Eremanthus schwackei Glaziou, Bull. Soc. Bot. France 3: 380. 1909, *nom. nud.*

Paralychnophora bicolor (DC.) MacLeish, Taxon 33: 106. 1984.

Paralychnophora schwackei (Glaziou) MacLeish, Taxon 33: 106. 1984, *nom. nud.*

Shrubs or trees 1.5–5.0 m tall, moderately branched; stems terete, usually grayish velutinous, distal internodes 0.3–1.0 cm long. Leaves alternate, petioles 0.5–1.8 cm long; blades oblong-

elliptical, 5–19 cm long, 3–6 cm wide, base rounded to attenuate, margins entire, apex rounded, upper surface minutely alveolate when dry, 9–15 secondary veins on each side. Inflorescences on long, ascending branches from upper leaf axils, branches with reduced, easily deciduous bracts, median bracts usually subopposite or opposite. Inflorescences becoming spherical when mature, 2.5–5.0 cm in diameter. Heads sessile; involucre bracts, in ca. 3 subequal series, linear, to 5 mm long, with reflexed, white-tomentose tips. Florets 2–4 in a head; corollas violet, ca. 7 mm long, tube 3–4 mm long, throat nearly lacking, lobes ca. 3 mm long, erect, with few hairs distally not extending beyond lobe tip, with numerous glands. Achenes ca. 3 mm long, glabrous, with idioblasts on surface; inner pappus bristles ca. 4.5 mm long, with slightly but distinctly broadened tips, outer pappus elements narrowly linear, ca. 1.5 mm long. Pollen ca. 45 μm in diameter.

Brazil. MINAS GERAIS: on sandstone outcrop ca. 3–5 km east of Serra, road to Diamantina, 9 Aug 1960, *Maguire, Magalhaes & Maguire 49119* (NY, US); slopes and summit of Serra Grão Mogol, 900–1100 m, frequent, on sandstone, 17 Aug 1960, *Maguire, Magalhaes & Maguire 49247* (NY, US); Serra do Espinhaço, ca. 18 km E of Diamantina, elev. 1100 m, rocky summits with soil-filled crevices and small areas of white sand, 19 Mar 1970, *Irwin, Fonsêca, Souza, Reis dos Santos & Ramos 27887* (NY, UB, US); ca. 35 km SW of Gouveia, km 243 on M.G. 259, 1080 m, very rocky sandstone hilltops with occasional wet spots, 2 Feb 1972, *Anderson, Stieber & Kirkbride 35116* (NY, UB, US); Ribeirão (mun. Grão Mogol), dos paredões rochosos na beira do correço, 23 Apr 1978, *Hatschbach 41421* (MBM, US); between Mendanha and Diamantina, 10 km NE of Diamantina on Estrada 367, campo rupestre, 4 Oct 1980, *MacLeish, Ferreira, Smith & Stutts 701* (GA, US); Grão Mogol, subida para Pasto, campo rupestre, encosta de morro junto a afloramentos rochosos, 17 May 1988, *Hatschbach & Ribas 52102* (MBM, US); Penha da França, ca. de 100 km ao nordeste de Diamantina, 18°5'S 43°5'O, ca. 1000 m, 11 Mar 1995, *Splett 868* (BONN, UB, US).

Glaziou (1909) named the plant the same way he named many others, indicating locality, “Diamantina,” habit, “arbusto,” and flower color, lilac. Such names have been regarded as nom. nud. by recent authors, and such species are accepted only after validation by later authors. No such validation has occurred for the Glaziou name, and now it seems that such validation is not necessary.

Material annotated as *Eremanthus schwackei* was distinct from extensive material from Bahia recently determined as *E. bicolor*. However, the types of both *E. schwackei* and *E. bicolor* are from Minas Gerais, and the original description (Candolle 1836) and subsequent critical description (Baker 1873) of *E. bicolor* state

that there are 2 or 3 florets in a head, indicating that *E. bicolor* and *E. schwackei* are the same species. It is the extensive material determined as *E. bicolor* from Bahia that needs to be placed in other species, including two that are new. The material determined as *E. schwackei* seems to differ from more typical *E. bicolor* only by the somewhat shorter, oblong leaves that are 5–12 vs. 11–19 cm long. One of the most distinctive features of the combined concept of *E. bicolor* and *E. schwackei* is the elongate, ascending inflorescence branches. The branches are particularly noticeable after the bracts have fallen. The median bracts of the branches are few, and they seem to be opposite or subopposite. Other less obvious, but apparently useful differences are the regularly alveolate upper surface of the dried leaf and the limited pubescence of the corolla lobes. All other members of the *Paralychnophora* group have minutely bullate or rugulose upper leaf surfaces and longer and denser pubescence on the corolla lobes. The Bahia material previously named as *E. bicolor* or *E. schwackei* proves to belong to either *E. reflexo-auriculatus* Barroso or one of the two following new species.

2. ***Eremanthus santosii*** H. Robinson, *sp. nov.* TYPE: BRAZIL. Bahia: Santa Maria Eterna, 1 a 2 km de estrada a Canavieiras, campo arenoso coberta de érvore e arbusto, 18 May 1970, *T.S. dos Santos* 820 (HOLOTYPE: CEPEC; ISOTYPE: US). (Figure 2)

Plantae frutescentes 2.5–4.0 m altae leniter ramosae; internodes distales 0.5–2.0 cm longis. Folia in laminis oblanceolata ad 18 cm longa base cuneata margine saepe recurvata apice rotundata in nervis secundariis utrinque ca. 15. Inflorescentiae in ramis interdum elongatis ascendentibus dispositae, bracteis alternis; flores in capitulo 2 aut 3; corollae in lobis distaliter dense longe pilosae.

Shrubs 2.5–4.0 m high, sparsely branched; stems terete below, sulcate when dried young, usually yellowish-brown velutinous, distal internodes 0.5–2.0 cm long. Leaves alternate, petioles mostly 1.0–2.5 cm long; blades oblanceolate, 13–18 cm long, 4.0–4.5 cm wide, base narrowly cuneate, margins entire, often broadly recurved, with sides nearly parallel in distal half, apex rounded, upper surface minutely bullate or rugulose when dry, ca. 15 close-set, spreading secondary veins on each side. Inflorescences on long, ascending branches from upper leaf axils or with spreading branches from lower axils, branches with reduced, easily decidu-

ous bracts, all bracts alternate. Inflorescences becoming spherical when mature, 2.5–3.0 cm in diameter. Heads sessile; involucre bracts, in ca. 3 subequal series, linear, to 7 mm long, with reflexed, white-tomentose tips. Florets 2 or 3 in a head; corollas violet, ca. 7 mm long, tube ca. 3.5 mm long, throat nearly lacking, lobes ca. 3.5 mm long, erect, with many hairs distally, some extending beyond lobe tip, with numerous glands. Achenes ca. 3 mm long, glabrous, idioblasts not seen; inner pappus bristles ca. 5 mm long, slightly broadened from bases to tips, outer pappus elements linear to setiform 0.5–1.0 mm long. Pollen ca. 50 μm in diameter.

PARATYPES: **Brazil.** BAHIA: Mt. Peludo, *H. M. Curran* 387 (US); Santa Maria Eterna km 1, a Canavieiras, campo arenoso, 13 Aug 1971, *T. S. dos Santos* 1812 (CEPEC, US); Serra do Sincorá, 3–13 km W of Barra da Estiva on road to Jussiape, 1000–1300 m, 13°40'S 41°25'W, low grassland with scattered woodland and small streams on white quartzite soils, growing on slope of sandstone ridge, 23 Mar 1980, *Harley, Bromley, Carvalho & Martinelli* 20809 (CEPEC, K, US); município de Abaira, Campos de Ouro Fino, próximo a Serra dos Bicanos, 1650 m, 13°16'S 41°54'W, campo rupestre, entre rochas, 16 July 1992, *Wilson Ganev* 671 (K, SPF, US).

Specimens of *Eremanthus santosii* have been identified as *Eremanthus bicolor* or as the synonymous *Paralychnophora schwackei* (Glaz.) MacLeish, which is identified here as *E. bicolor*. The new species includes specimens that have elongate, ascending inflorescence branches as in *E. bicolor*, and the two species share the characteristic of few-flowered heads. The first two specimens examined by this author initially seemed different from most specimens of *E. bicolor* because of the longer cuneate leaf bases. However, cuneate bases apparently occur in some specimens of *E. bicolor* (Baker 1873, pl. 45). The more important distinctions are the often less congested distal leaves with longer internodes, the slight difference in the bulging rather than depressed areoles on the upper surface of the leaves, the strictly alternate bracts on the inflorescence branches, and the presence of the larger, more numerous hairs on the corolla lobes. At present, *E. santosii* is known only from Bahia, while *E. bicolor* is known only from Minas Gerais. The leaves of the two dos Santos collections are pressed flat, but the leaves of the other three specimens show a strong tendency for the margins to recurve, a tendency noticed only in *E. reflexo-auriculatus* among other species of the group.

The new species is named for the collector of the type specimen, T. S. dos Santos of the Herbário Centro de Pesquisas do Cacau (CEPEC) in Ilhéus, Bahia.

3. **Eremanthus harleyi** H. Robinson, *sp. nov.* TYPE: BRAZIL. Bahia: Mun. Rio de Contas, Pico das Almas, Vertente leste, alto do vale acima da Faz, Silvina, 13°31'S 41°58'W, 1550 m, sobre rochas, 16 Dec 1988, *Harley 27255* (HOLOTYPE: CEPEC; ISOTYPES: K, SPF, US). (Figure 3)

Plantae frutescentes vel arborescentes 1–5 m altae; internodes distales 0.3–1.0 cm longis. Folia in laminis oblongo-elliptica plerumque 8–17 cm longa 3.5–8.0 cm lata base obtusa vel breviter acuta apice rotundata supra minute bullata vel rugulosa in nervis secundariis utrinque 6–12. Inflorescentiae saepe distincte laterales plerumque mediocriter vel late patentis, ramis brevibus vel mediocriter elongatis, bracteis alternis; flores in capitulo 5–9; corollae in lobis distaliter dense longe pilosae.

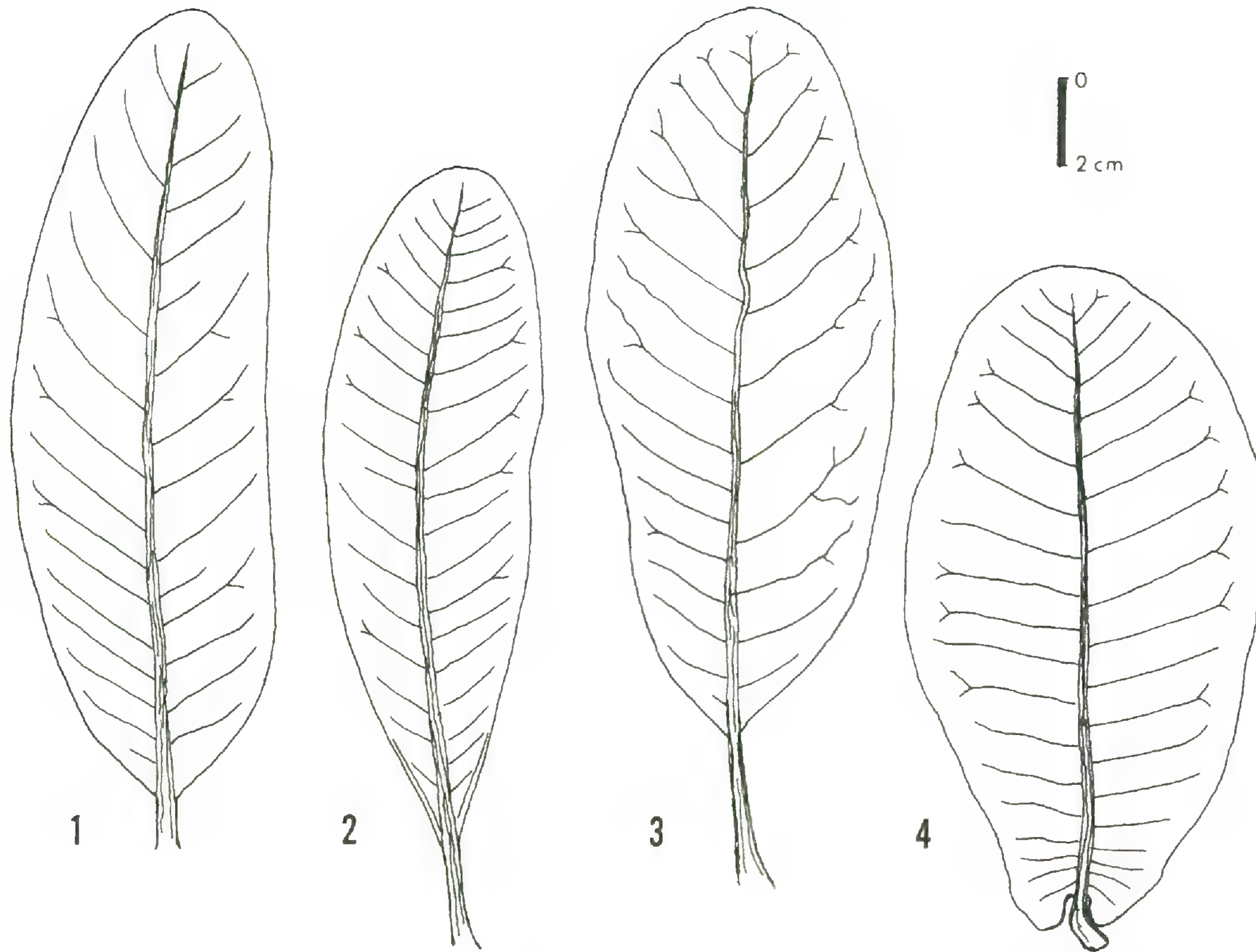
Shrubs to small trees 1.5–5.0 m high, moderately branched; trunks to 8 cm in diameter, terete below, young parts sulcate when dried, yellowish or brownish velutinous, internodes 0.5–2.5 cm long. Leaves alternate, petioles 1.0–3.5 cm long; blades oblong-ovate to elliptical, 8–17 cm long, 3.5–8.0 cm wide, base obtuse to shortly acute, margins entire, flat, apex rounded to obtuse, upper surface minutely bullate or rugulose, lower surface whitish to sordid tomentose, with prominent veins, with 6–12 secondary veins on each side of midrib, strongly arching distally. Inflorescence on short terminal peduncle or on spreading lateral branch mostly 8–15 cm long, bracteoles of branch alternate; inflorescence becoming spherical or subspherical when mature, 3.0–4.5 cm in diameter, with many lanceolate to elliptical foliose bracts at base, these 1–5 cm long. Heads sessile; involucre bracts in ca. 3 subequal series, linear, 5–7 mm long, densely white-tomentose outside. Florets 5–9 in a head; corollas rosaceous to violet, ca. 8.5 mm long, tube ca. 5 mm long, throat ca. 0.5 mm long, lobes ca. 3 mm long, with many hairs at tip, some extending beyond lobe tip, with numerous glands. Achenes ca. 3 mm long, glabrous, idioblasts not seen; pappus bristles ca. 7 mm long, slightly broadened from bases to tips, outer pappus elements setiform, 1–2 mm long, not broadened distally. Pollen ca. 48 μm in diameter.

PARATYPES: **Brazil.** BAHIA: Serra do Rio de Contas, 12–14 km N of town of Rio de Contas on road to Mato Grosso, ca. 1200 m, approx. 13°28'S 41°50'W, dry quartzite hillside with disturbed woodland on lower slopes and scrub above,

17 Jan 1974, *Harley, Renvoize, Erskine, Brighton & Pinheiro 15187* (CEPEC, K, US); Mun. de Rio de Contas, a 4 km ao NW de Rio de Contas, campo rupestre, ca. 1000 m, 21 July 1979, *King, Mori, T. S. dos Santos & Hage 8069* (CEPEC, US); base de Pico das Almas, a 18 km ao NW de Rio de Contas, ca. 1300 m, 24 July 1979, *King, Mori, T. S. dos Santos & Hage 8132* (CEPEC, US); Mun. de Mucugê, a 3 km ao S de Mucugê, na estrada que vai par Jussiape, ca. 1000 m, 26 July 1979, *King, Mori, T. S. dos Santos & Hage 8152* (CEPEC, US); Estrada que liga Mucugê com Andaraí a 11 km de primeiro, ca. 1150 m, 27 July 1979, *King, Mori, T. S. dos Santos & Hage 8170* (CEPEC, US); Mun. Lençóis, Serras dos Lençóis, Serra do Brejão ca. 14 km NW of Lençóis, western face of sandstone serra with horizontally bedded rocks, extensive grassland & marsh on lower slopes & small streams with low woodland, rock outcrops at high altitudes, with humid forest in rocky declivity below summit, 700–1000 m, 12°27'S 41°27'W, E6, 22 May 1980, *Harley, Bromley, Carvalho, Soares Nunes, Hage, & E. B. dos Santos 22335* (CEPEC, K, US); Vicinity of Pico das Almas, ca. 20 km NW of town of Rio de Contas, 3500–4600 ft., 25 Jan 1981, *King & Bishop 8668* (UB, US); 2 km along road S of Mucugê, 2600 ft., 31 Jan 1981, *King & Bishop 8712* (UB, US); 52 km E of Seabra, along road toward Itaberaba, 1900 ft., 2 Feb 1981, *King & Bishop 8774* (UB, US); Mun. of Lençóis, along BR242, ca. 15 km NW of Lençóis at km 225, ca. 900 m, campo rupestre, 10 June 1981, *Mori & Boom 14271* (NY, US); Estrada de Lençóis BR242, 5 km ao N de Lençóis, campo natural, 19 Dec 1981, *Carvalho, Lewis & Hage 1001* (CEPEC, US); Rio de Contas, arredores, campo rupestre, 17 May 1983, *Hatschbach 46552* (MBM, US); Mucugê, 5 km S, campo rupestre, solo arenoso, 22 Jan 1984, *Hatschbach 47486* (MBM, US); Mun. Piatã: Quebrada da Serra do Atalho, 13°13'S 41°50'W, 1600–1700 m, 26 Dec 1991, *Hind, Lughadha, Souza, Sakaragui e Ganev 50385* (CEPEC, HUEFS, K, SPF, US); Mun. de Abaíra, Belo Horizonte, acima do Jambreiro, próximo a Serra do Sumbaré, 13°18'S 41°52'W, 1350 m, campo rupestre com solo arenoso e grandes matações de rochas, 27 Oct 1992, *Ganev 1376* (HUEFS, K, SPF, US); Mun. Abaíra, Campo de Ouro Fino (alto), 13°15'S 41°54'W, 1700–1800 m, em capoeira e sobre e entre rochas na encosta do morro, 17 Jan 1992, *Hind & Queiroz 50071* (CEPEC, HUEFS, K, SPF, US).

Eremanthus harleyi includes the bulk of the material that has been identified in recent years as *E. bicolor* from Bahia. The present study has shown that true *E. bicolor* is mostly, if not totally, restricted to Minas Gerais and differs in having fewer florets in the heads, a different upper leaf surface, more closely set secondary veins of the leaf, opposite or subopposite median bracts on the inflorescence branches, and fewer, shorter hairs on the lobes of the corollas. *Eremanthus harleyi* is more closely related to *E. reflexo-auriculatus*, which also occurs in Bahia, but the latter differs in having the strong basal auricles on the leaf blade, the often strongly recurved leaf margins, and the foliose bracts at the base of the inflorescences that are more broadly ovate.

The species is named for Ray M. Harley of Kew, the collector of the type specimen and a specialist in the Lamiaceae, who has organized a number of trips to collect Bahian specimens.



Figures 1–4. Leaves of *Eremanthus* spp. 1. *E. bicolor* (Hatschbach 52102, US). 2. *E. santosii* (Ganev 671, US). 3. *E. harleyi* (Mori & Boom 14271, US). 4. *E. reflexo-auriculatus* (Harley 22766, US). Scale bar = 2 cm.

4. ***Eremanthus reflexo-auriculatus*** Barroso, *Rodriguésia* 35–36: 6. 1960–61 [1962]. (Figure 4)

Paralychnophora reflexo-auriculata (Barroso) MacLeish, *Taxon* 33(1): 106. 1984.

The species originally was described from Pernambuco (Barroso, 1960–1) to accommodate a specimen differing from *Eremanthus bicolor* in having strongly auriculate bases of the leaf blades. The leaf blades also commonly have broadly recurved margins. The species seems to be closely related to *E. harleyi*, which shares the shorter, usually more spreading branches and the 6–9-flowered heads, but the series of specimens seen from Bahia shows a consistent difference in the leaf base.

The following specimens of *Eremanthus reflexo-auriculatus* have been extracted from material in the U.S. National Herbarium previously identified as *E. bicolor*.

Brazil. BAHIA: Serra do Tombador, 20 Feb 1971, *Irwin, Harley & Smith 30689* (NY, US); Munic. Morro do Chapéu, 30–31 May 1980, *Harley, Bromley, de Carvalho, Soares Nunes, Hage & E. B. dos Santos 22766, 22867* (CEPEC, K, US); Morro do Chapéu, 16 June 1981, *Mori & Boom 14446* (NY, US); Munic. Jacobina, Serra do Tombador, ca. 25 km na estrada Jacobina/Morro do Chapéu, 20 Feb 1993, *Carvalho, Amorin & Jardim 4177* (CEPEC, US).

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